THE IMPACT OF MACROECONOMIC CONDITIONS ON THE HEALTH INSURANCE COVERAGE OF AMERICANS[*]

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1. Introduction

In March 2001, the longest economic expansion in U.S. history ended, and an economic recession began.[1] It is not yet known how the current recession will affect the number of Americans lacking health insurance. The primary objective of this paper is to improve our understanding of the historical relationship between state and national macroeconomic climate and the health insurance coverage of Americans. The secondary objective of this paper is to use the historical findings to predict how rates of uninsurance may change during the current U.S. recession.

Economic recession may increase the numbers of Americans lacking health insurance through several pathways. The first two involve reduced numbers of people with employer-provided health insurance. Table 1 lists the sources of insurance coverage for U.S. adults in 2000. 83.4 million (50 percent of all) adult Americans receive health insurance through their employer, and an additional 31.1 million (19 percent) receive it through the employer of a parent or spouse.

The first route by which recession may increase rates of uninsurance is by the newly unemployed losing health insurance provided by their previous employers. Although the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) allows eligible unemployed workers to temporarily purchase health insurance through their former employers,[2] take-up rates under COBRA are low.[3] In the majority of cases, the loss of employment involves the loss of any health insurance the worker received from the former employer. However, some who lose their jobs remain covered by insurance provided by a spouse's employer. Overall, 44 percent of those who lose their job become uninsured as a result.[4] Families USA estimates that between the time the current recession began in March 2001 and December 2001, 1.04 million newly

[1] Business Cycle Dating Committee, National Bureau of Economic Research (2002).
[2] COBRA stipulates that those who recently worked at firms with more than 20 employees have the option of continuing in their employer's health insurance plan for up to 18 months by paying (at most) 102% of the full premium for active employees. The Commonwealth Fund 2001 Health Insurance Survey found that 65% of current workers would be eligible for COBRA if they became unemployed; see Doty and Schoen (2001).
[3] Only 20 to 25 percent of those eligible for COBRA exercise the option to extend their health insurance coverage; see Rice (1999) and Rowland (2002). The most common explanation for the low take-up rate is cost; on average families pay annual premiums of $7,200 for coverage through COBRA, which represents up to two-thirds of the average worker's unemployment check; see Lambrew (2001).
[4] U. S. Bureau of Census (1998).

unemployed workers lost health insurance coverage. After adding the spouses and children of workers who lost their jobs, they estimate that 2.02 million total persons lost health insurance coverage due to unemployment.[5]

Second, recession may be accompanied by reduced health insurance coverage of those who remain employed. Employers may cease offering health insurance in order to cut costs in the face of falling profits. Alternatively, employers may reduce their contributions and shift health insurance costs to employees, causing additional employees to decline coverage. In addition, previously full-time workers may be shifted to part-time jobs that no longer qualify for health insurance benefits.

The third pathway by which recession may affect the number of uninsured is that state governments may reduce eligibility for publicly provided health insurance. Table 1 indicates that 7 million (4 percent of all) U.S. adults receive health insurance coverage through Medicaid. Medicaid spending is a large share of state budgets (on average, 15 percent)[6] so when state tax revenues fall due to recession, there is increased pressure to cut Medicaid budgets, potentially increasing the number of Medicaid-eligible individuals left without coverage. State governors have recently proposed numerous cuts in response to the current recession, including cuts in payments to providers.[7] Those covered by the State Children's Health Insurance Plan (SCHIP) may also be vulnerable to state budget cuts. Medicaid and SCHIP cover 15% of unemployed women and 53% of children with unemployed parents.[8] Two factors add to the current pressure on state governments to cut public health insurance programs: first, many states increased eligibility for public health insurance during the 1990s when state budget prospects were brighter, and second, health care costs appear to be increasing as a fraction of GDP after nearly nine years of stability.[9] On the other hand, some people might *gain* health insurance coverage during recession, if their incomes fall to a level that qualifies for Medicaid.

Finally, recession may affect the number of uninsured if those who previously purchased private health insurance become unable to afford it. Table 1 indicates that 9.4

[5] Families USA (2002) calculations based on BLS unemployment data and using Census Bureau methodology.
[6] Rowland (2002).
[7] Pear and Toner (2002).
[8] Lambrew (2001).
[9] Levitt et al. (2002).

million (6% of all) adult Americans are covered by privately purchased health insurance. As the ranks of the unemployed swell, people who previously were covered through their employer may purchase individual coverage.

Policymakers should be concerned about the loss of health insurance coverage during recession for several reasons. First, some of those who lose employer provided health insurance will join the rolls of publicly provided health insurance such as Medicaid and SCHIP, increasing the strain on the budgets of those programs. Second, uninsured persons may receive less medical treatment than the insured.[10] Third, uninsured persons may impose costs on the health care system by receiving what care they do receive in relatively inefficient ways, such as using the emergency room for conditions that could have been treated with an office visit, or being hospitalized for conditions that could have been treated on an outpatient basis.[11] Fourth, uninsured individuals are at risk of severe financial loss in the event of illness.[12]

The current U.S. recession creates an urgent need to better understand the relationship between macroeconomic climate and the health insurance coverage of the U.S. population. Our research will also provide answers to the following questions: How does the effect of local economic climate on insurance coverage differ for men, women and children? What aspects of the macroeconomy are correlated with health insurance coverage: Gross State Product, unemployment rate, or recession? Does the macroeconomic climate primarily affect rates of uninsurance through employment?

2. Related Literature

Most studies investigating determinants of insurance status include macroeconomic variables such as state unemployment rate as control variables, but the coefficients on these variables are not the focus of the study and are rarely discussed at any length in the text. Only a few studies focus on the link between macroeconomic

[10] Doyle (2001) exploits auto accidents as natural experiments and finds that auto accident victims who were uninsured received 20% less treatment and had 37% higher mortality than those who were insured.
[11] Weissman, Gastonis, and Epstein (1992).
[12] Jacoby, Sullivan, and Warren (2000) find that 45.6% of persons filing for bankruptcy either incurred at least $1,000 in medical bills not covered by insurance or listed illness or injury as the reason for filing for bankruptcy.

conditions and health insurance coverage. A Kaiser Family Foundation brief studied aggregate March CPS data for 1980-2000 and found that every percentage point rise in unemployment was associated with an increase of 1.2 million uninsured persons.[13] A study by Holahan and Garrett (2001) that is based on Ku and Garrett (2000) estimates that a percentage point increase in unemployment is associated with a rise in Medicaid enrollment of 1.5 million. Marquis and Long (2001) find mixed evidence that county unemployment rates are correlated with employer offers of health insurance and employer contributions to health insurance. They find that employers are more likely to offer health insurance in tight labor markets in 1993 but cannot reject the hypothesis of a zero correlation in 1997. They also find, contrary to their prediction, that the employer's contribution to employee health insurance is positively correlated with county unemployment rate.

While few papers have focused on the relationship between local unemployment rates and individual health insurance status, there has been considerable research on the relationship between individual health insurance status and labor force participation. In particular, a large literature has examined the effect of health insurance coverage on hours worked, retirement, or the labor force participation of married or low-income women.[14] Other recent research has assessed the impact of COBRA and the Health Insurance Portability and Accountability Act of 1996 (HIPAA) on the probability that unemployed individuals have health insurance.[15] In its focus on macroeconomic conditions as the key independent variables, this paper also relates to a recent literature that examines the impact of macroeconomic conditions on health status or health behaviors.[16]

3. Methods

We first estimate a model in which the dependent variable indicates whether an individual has any health insurance coverage at a particular point in time. The empirical analysis is based on a random utility model. Suppose that each person derives utility

[13] Gruber and Levitt (2002).
[14] Currie and Madrian (1999) and Gruber (2000) provide comprehensive reviews of this literature.
[15] See, e.g. Gruber and Madrian (1997), Berger et al. (2000), and Baumgardner (1998).
[16] See Ruhm and Black (2001), Dee (2001), Ruhm (2000), and Joyce (1990).

based on insurance status; people enjoy utility U_{INS} if they are insured, and utility U_{UNINS} if they are uninsured. The utility derived from being insured or uninsured depends upon individual characteristics X and macroeconomic conditions M :

$$U_{INS} = \alpha_{INS} + X\beta_{INS} + M\gamma_{INS} + \varepsilon_{INS}$$
$$U_{UNINS} = \alpha_{UNINS} + X\beta_{UNINS} + M\gamma_{UNINS} + \varepsilon_{UNINS}$$

Macroeconomic conditions may affect the utility of being insured if, for example, recession raises the cost of achieving health insurance coverage.

Let $y = 1$ if the individual is insured and $y = 0$ if the individual is uninsured. The probability that a person is insured is equal to the probability that utility in the insured state exceeds utility in the uninsured state.

$$\Pr[y = 1] = \Pr[U_{INS} > U_{UNINS}]$$
$$\Pr[y = 1] = \Pr[(\varepsilon_{INS} - \varepsilon_{UNINS}) > -(\alpha_{INS} - \alpha_{UNINS}) - X(\beta_{INS} - \beta_{UNINS}) - M(\gamma_{INS} - \gamma_{UNINS})]$$
$$\Pr[y = 1] = \Pr[\varepsilon > -\alpha - X\beta - M\gamma]$$

The distribution of the differenced error term determines the proper regression model to use to estimate the probability of health insurance coverage of individual i living in state s at time t as a function of macroeconomic conditions M and individual characteristics X . This paper assumes that the differenced error term follows a binomial distribution; as a result, linear probability models will be estimated.

(1) $$y_{ist} = \alpha + X_{it}\beta + M_{st}\gamma + \varepsilon_{ist}$$

Macroeconomic conditions M include unemployment rates at the state or local level, real per capita Gross State Product, and an indicator variable that equals one if time *t* is during an economic recession; a set of indicator variables for year are also included. Individual-specific fixed effects are removed. Individual characteristics X include time-varying factors that may affect the person's probability of being uninsured, including age, marital status, education, and family size.

The parameters of interest are the γ coefficients, which will be used to measure the change in the probability that individuals lack health insurance coverage associated with the change in macroeconomic variables. The hypothesis of this paper is that

national recession, higher unemployment, and lower gross state product per capita are associated with lower probabilities of overall health insurance coverage.

Models similar to equation (1) will also be estimated for the following dependent variables: an indicator for whether one receives health insurance coverage through one's current employer, an indicator for whether one's current employer *offers* health insurance, an indicator for whether one receives health insurance coverage through the employer of one's spouse, an indicator for whether one has privately-purchased health insurance coverage, an indicator for whether the individual is covered by government-provided health insurance, an indicator for whether one's children are covered by health insurance through any source, and an indicator for whether one's children are covered through government-provided health insurance.

We predict that the coefficients on variables for macroeconomic conditions will have the following sign, depending on the dependent variable (the source of the health insurance). Higher unemployment rate and national recession are assumed to decrease the probability of coverage through any source, any employer, and own employer because higher unemployment rate implies both increased numbers of individuals lacking jobs and lower total compensation (wages plus benefits). Higher GSP is predicted to increase the probability of coverage through these sources because boom times imply more jobs and higher compensation. We do not have unambiguous predictions about the signs of the coefficients on macroeconomic variables in the regressions for coverage through spouse's employer, privately purchased plans, or the government, because there are potentially offsetting effects. Higher unemployment rate and recession may lead to loss of the spouse's job, but may also lead to loss of own job and switching to coverage through the spouse's employer. Likewise, such changes in the macroeconomy may increase the probability of privately purchased coverage because people lose their employer-provided coverage and begin to purchase it privately, but they could also make such coverage less affordable. Similarly, such changes may increase the probability of coverage through the government because people's incomes fall to the point they qualify for Medicaid, or it may lead state legislatures to tighten eligibility requirements in order to decrease the Medicaid rolls.

Source of Health Insurance Coverage	Unemployment Rate	Real per capita Gross State Product	Indicator for National Recession
Any	-	+	-
Any Employer	-	+	-
Own Employer	-	+	-
Spouse's Employer	?	?	?
Privately Purchased	?	?	?
Government Provided / Medicaid	?	?	?

In order to determine the extent to which macroeconomic conditions affect health insurance coverage through all mechanisms, we first estimate model (1) with only the demographic characteristics and macroeconomic conditions included as regressors. Changes in employment status is one important route by which macroeconomic conditions affect health insurance; we estimate the probability of employment as a function of demographic characteristics and macroeconomic conditions. Finally, we re-estimate model (1) controlling for employment status.

4. Data

The relationship between state and national economic climate and individuals' health insurance status is measured using data from two nationally representative samples: the Survey of Income and Program Participation and the National Longitudinal Survey of Youth.[17] Each of the data sets is well-suited for a study of health insurance and the macroeconomy in that they both follow the same individuals over a considerable period of time, enabling us to remove individual fixed effects. An advantage of the SIPP is its large sample size, and advantages of the NLSY are its rich information about labor market experience and a larger set of questions about health insurance. In most cases, the

[17] The Current Population Survey (CPS) is another data set commonly used to assess the health insurance coverage of Americans. The advantages of the NLSY and SIPP over the CPS are that they track individuals for long periods of time and they record health insurance coverage at a particular point in time whereas the CPS records whether the individual had health insurance coverage at any time in the past year. Bennefield (1996) finds that CPS respondents tend to underreport health insurance coverage relative to SIPP respondents.

SIPP will serve as the primary dataset, with the NLSY estimates used as a robustness check.

4a. The Survey of Income and Program Participation

The Survey of Income and Program Participation (SIPP) is a nationally representative sample of Americans over the age of 15[18] and consists of a series of four-year panels starting in 1984 with sample sizes ranging from approximately 14,000 to 36,700 households. The SIPP interviews households at 4-month intervals (collecting data on the current month and, retrospectively, each of the three months between interviews) for up to 4 years. Each wave contains information on the source of health insurance coverage during each month as well as periods of uninsurance over the last 12 months. The SIPP also contains information on job status and demographic characteristics that influence the choice of insurance status (e.g. age, race, sex, education, marital status, and family size). Publicly available state identifiers permit the merger of macroeconomic variables with the SIPP data. This paper uses data from the 1990-1996 panels of the SIPP covering the period 1990-1998. Summary statistics of the NLSY data appear in Table 2A. In order to avoid recall bias we do not use the retrospective data; we instead focus exclusively on data collected for the current month in which the respondent is interviewed.

4b. The National Longitudinal Survey of Youth

The National Longitudinal Survey of Youth (NLSY) contains data from interviews of 12,686 respondents conducted annually 1979-1994 and every two years 1994-2000. We use data from 1983-2000 on whether the respondent's primary employer offers health insurance coverage. In the 1989-2000 interviews, respondents were also asked whether they, their spouse, and their children are currently covered by health insurance; the source of the insurance was recorded. The NLSY contains a rich set of information about the respondents' labor force activity and human capital. Restricted-access geocodes permit the merger of macroeconomic variables with the NLSY data. Summary statistics of the NLSY data appear in Table 2B.

[18] There are also interview records for children in the household.

4c. Data on Macroeconomic Conditions

The key explanatory variables that reflect the economic climate are: monthly state unemployment rate, annual per capita real Gross State Product, and an indicator variable for national recession. Measures of Gross State Product are derived from the Regional Accounts Data collected by the Bureau of Economic Analysis of the U. S. Department of Commerce. Figure 1 plots the national real quarterly Gross Domestic Product. We identify the effect of Gross State Product on rates of uninsurance using individual-specific variation over time in per capita real GSP; this individual-specific variation occurs in two possible ways; first, when individuals move between states that differ in their per capita real GSP, and when individuals remain in the same state but the per capita real GSP in that state varies over time. To describe the variation across states in mean GSP and variation of GSP within states over time, Figure 2 depicts the mean of per capita Gross State Product between 1980 and 1999, and Figure 3 depicts its variance.

The Bureau of Labor Statistics Local Area Unemployment Statistics Series is the source for monthly unemployment rates at the state level. Figure 4 plots national monthly unemployment. The peaks in unemployment rate in Figure 4 tend to occur after the recessions listed in Table 3; unemployment rate is a lagging indicator of recession.[19] As with GSP, we identify the effect of unemployment rates on rates of uninsurance using individual-specific variation over time that occurs when individuals move between states that differ in their unemployment rates and when individuals remain in the same state but the unemployment rate in that state varies over time. To describe the variation across states in mean unemployment rate and variation of unemployment rate within states over time, Figure 5 depicts the mean of state unemployment rate 1980 to 1999 and Figure 6 depicts its variance.

We also include as a regressor an indicator variable for whether the United States was in economic recession. The coding of this variable is based on the decisions of the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER). The NBER does not define a recession in terms of two consecutive quarters of decline in real GNP, but rather as "a period of significant decline in total output, income,

[19] Business Cycle Dating Committee (2002).

employment, and trade, usually lasting from six months to a year, and marked by widespread contractions in many sectors of the economy."[20] Table 3 lists the NBER's business cycle reference dates since World War II. The final row of Table 3 indicates that the previous expansion (the longest on record) lasted from March 1991 to March 2001. The NBER has not yet determined the date of the trough (i.e. the end date) of the current recession.[21] The data used in this paper allow study of uninsurance during the previous recession that lasted from July 1990 to March 1991.

Ideally we would know the cost of private health insurance over geographic regions and time. Instead, the Medicare Hospital Input Price Index is used to proxy for differences in the cost of health insurance. The SIPP regressions also control for Medicaid eligibility standards for children across states and over time.[22]

5. Empirical Results

The probability that an individual has health insurance coverage is first estimated as a function of macroeconomic conditions and basic demographic characteristics. Table 4A contains results for males in the SIPP and Table 4B contains results for males in the NLSY. In the first two columns of Table 4A, our predictions regarding unemployment rate and GSP are confirmed, while that for the recession indicator is not. Table 4A indicates that a one percentage point increase in the state unemployment rate is associated with a 0.57% decrease in the probability that a SIPP male is covered by health insurance through any source and a 0.78% decrease in the probability of coverage through an employer. Also in Table 4A, an increase in real GSP per capita of $1,000 increases the probability of any coverage by 0.18% and the probability of coverage through an employer by 0.07%. Surprisingly, the indicator variable for national recession has a positive and statistically significant coefficient, implying that during recession men are 0.39% more likely to have health insurance through any source and 0.50% more likely to be covered by an employer. The surprising sign on the indicator for national recession

[20] Public Information Office, National Bureau of Economic Research (2002).
[21] Business Cycle Dating Committee (2002).
[22] This index of eligibility standards is calculated by simulating the percentage of a representative state's population of children would qualify for Medicaid if subject to each state's eligibility standards. A similar index is used in Cutler and Gruber (1996).

may be the result of multicollinearity between our three measures of the macroeconomy. In the third and fourth columns of Table 4A, corresponding to government-provided coverage, the coefficient signs on unemployment rate and GSP are opposite to their sign in the first two columns; a weak macroeconomy is associated with a higher probability of government-provided coverage for SIPP males. In Table 4B, which corresponds to males in the NLSY, the coefficients are generally not statistically significant; the exceptions are that state unemployment rate is associated with a lower probability of coverage through one's own employer and a higher probability of privately-purchased coverage.

Table 5A contains results for females in the SIPP and Table 5B contains results for females in the NLSY. The results for SIPP women in Table 5A imply that a one percentage point rise in local unemployment rate is associated with a 0.46% decrease in the probability that a woman has coverage through any source, and a 0.22% decrease in the probability of coverage through an employer. An increase in real GSP per capita of $1,000 increases the probability of any coverage by 0.11% and the probability of coverage through an employer by 0.18%. There are some major gender differences in the results for the SIPP. The coefficient on the indicator variable for national recession is generally statistically significant for the SIPP men in Table 4A but is not statistically significant for the SIPP women in Table 5A. Moreover, GSP is associated with a lower probability of government-provided coverage for SIPP men but a higher probability of it for SIPP women. In Table 5B, which corresponds to females in the NLSY, the coefficients are generally not statistically significant.

Tables 6A and 6B describe the relationship between macroeconomic conditions and whether children have health insurance coverage in the SIPP and the NLSY. In Table 6A, a one percentage point increase in state unemployment rate is associated with a 1% decrease in the probability that the child is covered, and a 0.72% increase in the probability that the child is covered through the government. A $1,000 increase in real GSP per capita is associated with a roughly 0.1% increase in both the probability of coverage from any source and through the government specifically. Surprisingly, coverage is 0.55% more likely during recession, but being covered through the government is 0.35% less likely. In Table 6B, state unemployment is uncorrelated with

the probability has coverage through any source, but a 1% increase in unemployment increases the probability of coverage through the government by 0.33%.

An important way that the macroeconomy affects individuals' health insurance status is through their employment status. The remainder of the paper is devoted to determining the extent to which the earlier results (that are not conditioned on employment status) are in fact driven by changes in employment status.

Tables 7A and 7B contain the results of regressions in which the dependent variable is an indicator variable that equals one if the respondent is currently employed. For both women and men in the SIPP and NLSY, individuals are, predictably, less likely to be employed when state or local unemployment rates are high. In the SIPP, a one percentage point rise in local unemployment rate is associated with a 0.89% decrease in the probability of employment for men, and a 0.82% decrease for women. In the NLSY, the same one percentage point rise in local unemployment rate is associated with a 0.64% decrease in the probability of employment for men, and a 0.41% decrease for women. Part of the reason for the discrepancy in magnitudes between the SIPP and the NLSY may be that the SIPP sample contains older workers whereas the NLSY is limited to younger workers. In the SIPP, real GSP is also correlated with employment; a $1,000 increase in per capita real GSP is associated with a 0.05% increase in the probability of employment for men and a 0.06% increase for women. Only for SIPP males is the recession indicator significantly correlated with employment; recession is associated with a 0.5% decrease in the probability of employment for this group.[23]

The NLSY also asks respondents whether their employer offered them health insurance coverage. The correlation of employer offers with macroeconomic conditions for the sample of employed respondents is described in Table 8. A one percentage point increase in unemployment rate is associated with a 0.73% decrease in the probability that one's employer offers health insurance coverage for males and a 0.27% decrease for females.

[23] Part-time workers are often not eligible for employer-provided benefits, including health insurance. In order to test whether recession affects the probability of part-time employment, we regressed an indicator for part-time employment on macroeconomic conditions and demographic characteristics for employed members of the NLSY sample. A one percentage point increase in the unemployment rate is associated with a 0.39% increase in the probability that employment is part-time for men and a 0.85% increase in the probability that employment is part-time for women.

We also tested for changes in take-up rates of employer-offered health insurance during periods of high unemployment. Specifically, we regressed an indicator variable for whether one receives health insurance coverage through one's own employer on macroeconomic variables for the sample of NLSY respondents who were employed and were offered health insurance coverage by their employers. The coefficient on unemployment rate was statistically significant for women; a one percentage point increase in local unemployment rate is associated with a 0.7% increase in the probability of take-up for women; the results for men were not statistically significant.[24]

The remainder of this section measures the extent to which macroeconomic conditions are correlated with insurance status conditional on employment status. Tables 9A/9B and 10A/10B are comparable to Tables 4A/4B and 5A/5B with the difference that an indicator for employment has been added to the set of regressors. The coefficients on the indicator variable for employment are uniformly positive, large, and statistically significant, confirming that employment status has a large impact on the probability of coverage.

Tables 9A and 10A indicate that, even controlling for employment, unemployment rate and GSP remain correlated with the probability of health insurance coverage. In Table 4A, before controlling for employment status, a one percentage point rise in unemployment was associated with a 0.57% decrease in the probability of health insurance coverage for SIPP men. In Table 9A, after controlling for employment status, the associated decrease is 0.40%; about thirty percent of the correlation of men's health insurance coverage with unemployment rates seems to operate through changes of employment status. Controlling for employment status has little effect on the point estimates of the coefficients on GSP.

A comparison of Tables 9B and 4B indicates that in the NLSY slightly more than a third of the correlation between unemployment rate and the probability of coverage through one's own employer works through employment status, but that changes in employment status explain none of the correlation between unemployment rate and the probability of privately-purchased coverage.

[24] Cutler (2002) finds that employee take-up rates fell during the 1990s.

Similar results hold for the samples of women. In Table 5A, before controlling for employment status, a one percentage point rise in unemployment was associated with a 0.46% decrease in the probability of health insurance coverage for SIPP women. After controlling for employment status, the associated decrease listed in Table 10A is 0.32%; as for the SIPP men, roughly thirty percent of the correlation of women's health insurance status with unemployment rates appears to be due to changes of employment status. As for men, controlling for employment status has little effect on the point estimates of the coefficients on GSP. In Table 10B, as in Table 5B, the probability that an NLSY woman is covered by health insurance from any source appears unrelated to macroeconomic conditions.

6. Conclusion

This paper examines how the probability of health insurance coverage varies in response to macroeconomic conditions. The results confirm our prediction that the probability of any health insurance coverage is negatively associated with unemployment rate and positively associated with gross state product. We find that a one percentage point increase in state unemployment rate is associated with a decrease in the probability of health insurance coverage of 0.57% for men, 0.46% for women, and 1.0% for children. An increase in real gross state product of $1,000 per capita increases the probability of coverage by 0.18% for men, 0.11% for women, and 0.12% for children.

However, our prediction that an indicator variable for national recession would be negatively correlated with the probability of health insurance coverage was not supported by the data. The coefficient is of opposite sign for men and children; for women it is not statistically significant.

Employment status is correlated with both macroeconomic conditions and with the probability of health insurance coverage. Changes in employment status explain roughly thirty percent of the correlation between health insurance coverage and unemployment rates; employment status does not explain much of the correlation between insurance coverage and GSP. This paper also finds that employer offers of health insurance are sensitive to the local unemployment rate. Women appear to be more likely to take up employer-offered health insurance when unemployment rates are high.

Caution should be used when estimates derived from the last recession are used to estimate the impact of the current recession. The last recession was over ten years ago, and several factors have changed that may affect the relationship between the macroeconomy and health insurance coverage. For example, more couples are dual-earner, suggesting that the impact of one spouse losing employer-provided health insurance may be less than in the past.

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Table 1
Source of Insurance Coverage for U. S. Adults in Year 2000

Insurance Source	Number (Thousands)	Percent
Employer: Own	83,385	50%
Employer: Other's	31,148	19%
Individual	9,438	6%
Medicaid	7,029	4%
Other	6,646	4%
Uninsured	29,261	18%
Total	166,907	100%

Notes:

1) Source: Lambrew (2001), Appendix Table 1.
2) Data: March 2001 Current Population Survey. CPS respondents were asked to report whether they had some health insurance coverage in the previous year.
3) Sample includes all U.S. adults aged 18 to 64.

Table 2A
Summary Statistics of SIPP Data

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Indicator: covered by own employer HI	1,398,270	0.461	0.498	0	1.0
Indicator: covered by any HI	1,398,270	0.747	0.434	0	1.0
Indicator: covered by Medicaid	1,398,270	0.067	0.250	0	1.0
Indicator: covered by gov't health ins	1,398,270	0.113	0.316	0	1.0
Indicator: national recession	1,398,270	0.060	0.239	0	1.0
State unemployment rate	1,398,270	6.139	1.662	1.9	12.80
State gross product per capita	1,398,270	23.039	5.568	11.54	94.66
Hospital wage index	1,398,270	7128.50	291269	0	12456
Indicator: Hospital wage index missing	1,398,270	0.131	0.338	0	1.0
Simulated state Medicaid generosity	1,398270	0.361	0.137	0.175	0.932
Indicator: female	1,398,270	0.522	0.499	0	1.0
Year	1,398,270	1993.85	2.457	1990	1998
Indicator: High-school dropout	1,398,270	0.165	0.371	0	1.0
Indicator: High-school graduate	1,398,270	0.334	0.471	0	1.0
Indicator: Some college	1,398,270	0.266	0.441	0	1.0
Indicator: College graduate	1,398,270	0.137	0.344	0	1.0
Age	1,398,270	38.563	12.472	18	64
Presence of children in family	1,398,270	0.527	0.499	0	1.0
Indicator: employed	1,398,270	0.724	0.446	0	1.0
Indicator: married	1,398,270	0.598	0.490	0	1.0
Indicator: widowed	1,398,270	0.022	0.148	0	1.0
Indicator: separated or divorced	1,398,270	0.128	.334	0	1.0
Indicator: child covered by any HI	609,223	0.6722	0.469	0	1.0
Indicator: child covered by gov't HI	609,223	0.2214	0.415	0	1.0

Notes:

1) The sample for all but the last two items consists of adults (age 18-64). The sample for the last two items is all children under age 18.
2) The outlier state for the Medicaid generosity variable is Tennessee, which officially provided Medicaid up to 400% of poverty.

Table 2B:
Summary Statistics of NLSY Data

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Indicator: employer offers HI	102,135	.743	.44	0	1
Indicator: covered by HI	71,163	.794	.40	0	1
Indicator: HI from current employer	71,146	.478	.50	0	1
Indicator: HI from spouse employer	71,147	.181	.39	0	1
Indicator: private HI	71,147	.044	.21	0	1
Indicator: government-provided HI	71,147	.079	.27	0	1
Indicator: child covered by HI	43,912	.776	.42	0	1
Indicator: child HI from Medicaid	43,844	.126	.33	0	1
Indicator: national recession	117,108	.086	.28	0	1
State unemployment rate	117,108	6.38	2.16	1.7	21.6
Per capita real gross state product	117,108	19.08	8.48	5.89	104.01
Medical Hospital Wage Index	93,919	8392.1	957.07	4089	14870
Indicator: female	117,108	.494	.50	0	1
Indicator: black	117,108	.271	.44	0	1
Indicator: Hispanic	117,108	.175	.38	0	1
Year	117,108	1990.86	4.76	1983	2000
Highest grade completed	116,597	12.85	2.36	0	20
Age	117,108	29.81	5.22	18	44
Family size	117,108	3.14	1.70	1	18
Indicator: employed	117,108	.854	.35	0	1
Indicator: married, spouse present	117,108	.483	.50	0	1
Indicator: other marital status	117,108	.158	.37	0	1

Table 3
Business Cycle Reference Dates
For United States, Post-World-War-II

NBER Business Cycle Reference Dates		Duration in Months			
Trough	**Peak**	**Trough From Previous Peak (Contraction)**	**Trough to Peak (Expansion)**	**Trough to Trough**	**Peak to Peak**
October 1945	November 1948	8	37	88	45
October 1949	July 1953	11	45	48	56
May 1954	August 1957	10	39	55	49
April 1958	April 1960	8	24	47	32
February 1961	December 1969	10	106	34	116
November 1970	November 1973	11	36	117	47
March 1975	January 1980	16	58	52	74
July 1980	July 1981	6	12	64	18
November 1982	July 1990	16	92	28	108
March 1991	March 2001	8	120	100	128

Notes:
Source: Public Information Office, National Bureau of Economic Research (2002).
The NBER defines recession as "a period of significant decline in total output, income, employment, and trade, usually lasting from six months to a year, and marked by widespread contractions in many sectors of the economy." (Ibid.)

Table 4A
SIPP Men
Whether Covered by Health Insurance
as a Function of Macroeconomic Conditions
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Any Source	Employer Coverage	Medicaid	Gov't Provided
Indicator: National Recession	.0039 (2.14)	.0050 (2.39)	-.0016 (-1.92)	-.0019 (-1.62)
State Unemployment Rate	-.0057 (-10.87)	-.0078 (-12.95)	.0020 (8.32)	.0027 (9.19)
Real Gross State Product	.0018 (7.25)	.0007 (2.45)	-.0005 (-4.40)	-.0008 (-5.02)
Number of Observations	667,854	667,854	667,854	667,854

Notes:

1) Data: pooled 1990-1996 waves of the SIPP. Sample includes all individuals between the ages of 17 and 64 years of age regardless of employment status.
2) Dependent variables: column 1: indicator variable that equals one if individual covered by health insurance from any source and zero otherwise; column 2: indicator variable that equals one if individual is covered by employer health insurance in own name and zero otherwise; column 3: indicator variable for Medicaid coverage; column 4: indicator variable for any type of government provided health insurance.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, highest grade completed, marital status, presence of children in the family, and age.

Table 4B
NLSY Men
Whether Covered By Health Insurance
as a Function of Macroeconomic Conditions
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Any Source	Own Current Employer	Spouse's Current Employer	Privately Purchased	Gov't Provided
Indicator:	.0101	-.0617	.0618	-.0067	.0430
National Recession	(0.17)	(-0.96)	(1.55)	(-0.20)	(1.70)
State Unemployment	-.0015	-.0059	-.0002	.0042	.0015
Rate	(-0.66)	(-2.32)	(-0.16)	(3.18)	(1.52)
Real Gross	.0005	.0006	.0004	-.0003	.0001
State Product	(0.63)	(0.70)	(0.77)	(-0.80)	(0.37)
Number of Observations	34,677	34,677	34,677	34,677	34,677

Notes:

1) Data: 8 pooled years of the NLSY. Sample includes the employed and those not employed.
2) Dependent variables: column 1: indicator variable that equals one if individual has health insurance coverage from any source and zero otherwise; column 2: indicator variable that equals one if individual has health insurance coverage through their current employer and zero otherwise; column 3: indicator variable that equals one if individual has health insurance coverage through spouse's current employer and zero otherwise; column 4: indicator variable that equals one if individual has privately-purchased health insurance coverage and zero otherwise; column 5: indicator variable that equals one if individual has government-provided health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Table 5A
SIPP Women
Whether Covered by Health Insurance
as a Function of Macroeconomic Conditions
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Any Source	Employer Coverage	Medicaid	Gov't Provided
Indicator: National Recession	.0028 (1.62)	.0005 (0.25)	-.0016 (-1.40)	-.0005 (-0.41)
State Unemployment Rate	-.0046 (-9.15)	-.0022 (-3.90)	.0030 (9.16)	.0026 (6.69)
Real Gross State Product	.0011 (4.95)	.0018 (7.13)	.0014 (9.65)	.0011 (6.39)
Number of Observations	730,416	730,416	730,416	730,416

Notes:

1) Data: pooled 1990-1996 waves of the SIPP. Sample includes all individuals between the ages of 17 and 64 years of age regardless of employment status.
2) Dependent variables: column 1: indicator variable that equals one if individual covered by health insurance from any source and zero otherwise; column 2: indicator variable that equals one if individual is covered by employer health insurance in own name and zero otherwise; column 3: indicator variable for Medicaid coverage; column 4: indicator variable for any type of government provided health insurance. .
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, highest grade completed, marital status, presence of children in the family, and age.

Table 5B
NLSY Women
Whether Covered By Health Insurance
as a Function of Macroeconomic Conditions
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Any Source	Own Current Employer	Spouse's Current Employer	Privately Purchased	Gov't Provided
Indicator: National Recession	.0711 (0.90)	.0127 (0.14)	.1049 (1.35)	.0241 (0.56)	.0362 (0.64)
State Unemployment Rate	.0030 (1.42)	-.0013 (-0.55)	-.0043 (-2.11)	.0017 (1.55)	.0066 (4.42)
Real Gross State Product	.0012 (1.60)	-.00001 (-0.08)	.00057 (0.69)	-.0001 (-0.30)	.0011 (1.98)
Number of Observations	36,465	36,465	36,465	36,465	36,465

Notes:

1) Data: 8 pooled years of the NLSY. Sample includes the employed and those not employed.
2) Dependent variables: column 1: indicator variable that equals one if individual has health insurance coverage from any source and zero otherwise; column 2: indicator variable that equals one if individual has health insurance coverage through their current employer and zero otherwise; column 3: indicator variable that equals one if individual has health insurance coverage through spouse's current employer and zero otherwise; column 4: indicator variable that equals one if individual has privately-purchased health insurance coverage and zero otherwise; column 5: indicator variable that equals one if individual has government-provided health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Table 6A
SIPP
Whether Child Has Health Insurance Coverage
as a Function of Macroeconomic Conditions
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Child Has Any Coverage	Child Has Government-Provided Coverage	Child Has Medicaid Coverage
Indicator: National Recession	.0055 (3.01)	-.0035 (-2.12)	-.0038 (-2.41)
State Unemployment Rate	-.01 (-18.58)	.0072 (14.90)	.0071 (15.44)
Real Gross State Product	.0012 (4.49)	.001 (4.05)	.0011 (4.97)
Number of Observations	642,703	642,703	642,703

Notes:

1) Data: pooled 1990-1996 waves of the SIPP.
2) Dependent variables: column 1: indicator variable that equals one if child covered by any health insurance from any source and zero otherwise; column 2: indicator variable that equals one if child has government-provided health insurance coverage and zero otherwise; column 3: indicator variable that equals one if child covered by Medicaid and zero otherwise.
3) The samples in both cases consist of those who are under 18 years of age.
4) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, and age.

Table 6B
NLSY
Whether Child Has Health Insurance Coverage
as a Function of Macroeconomic Conditions
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Child Has Any Coverage	Child Has Government-Provided Coverage
Indicator: National Recession	.0317 (0.51)	.0428 (0.74)
State Unemployment Rate	.0009 (0.52)	.0033 (2.04)
Real Gross State Product	.0004 (0.60)	-.0006 (-0.83)
Number of Observations	43,833	43,833

Notes:

1) Data: 8 pooled years of the NLSY.
2) Dependent variables: column 1: indicator variable that equals one if child has health insurance coverage from any source and zero otherwise; column 2: indicator variable that equals one if child has government-provided health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, and family size.

Table 7A
SIPP
Whether Currently Employed
as a Function of Macroeconomic Conditions
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Men	Women
Indicator: National Recession	-.005 (-2.73)	.0006 (0.29)
State Unemployment Rate	-.0089 (-16.85)	-.0082 (-14.04)
Real Gross State Product	.0005 (2.00)	.0006 (2.53)
Number of Observations	667,854	730,416

Notes:

1) Data: pooled 1990-1996 waves of the SIPP. Sample includes all individuals between the ages of 17 and 64 years of age regardless of employment status.
2) Dependent variable equals one if employed during the survey month and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, highest grade completed, marital status, presence of children in the family, and age.

Table 7B
NLSY
Whether Currently Employed
as a Function of Macroeconomic Conditions
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Men	Women
Indicator: National Recession	.0503 (1.22)	-.0286 (-0.38)
State Unemployment Rate	-.0064 (-7.24)	-.0041 (-3.55)
Real Gross State Product	-.0002 (-0.35)	.0003 (0.45)
Number of Observations	59,233	57,875

Notes:

1) Data: 15 pooled years of the NLSY. Sample includes the employed and those not employed.
2) Dependent variable equals one if individual is employed at time of survey and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Table 8
NLSY
Whether Current Employer Offers Health Insurance
as a Function of Macroeconomic Conditions
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Men	Women
Indicator: National Recession	.0534 (0.76)	.0986 (1.00)
State Unemployment Rate	-.0073 (-5.59)	-.0027 (-1.94)
Real Gross State Product	.00001 (0.02)	.0003 (0.38)
Number of Observations	51,241	43,702

Notes:

1) Data: 15 pooled years of the NLSY. Sample includes only those currently employed.
2) Dependent variable equals one if current employer offers health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Table 9A
SIPP Men
Whether Covered by Health Insurance
as a Function of Macroeconomic Conditions and Employment Status
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Any Source	Employer Coverage	Medicaid	Gov't Provided
Indicator: National Recession	.0048 (2.69)	.0064 (3.11)	-.0020 (-2.443)	-.0025 (-2.25)
State Unemployment Rate	-.0040 (-7.89)	-.0054 (-9.28)	0.0013 (5.47)	.0016 (4.89)
Real Gross State Product	.0016 (7.00)	.00056 (2.04)	-.0005 (-5.47)	-.0007 (-4.71)
Indicator: Employed	.1850 (144.77)	.2676 (184.05)	-.0816 (-135.88)	-.1282 (-158.43)
Number of Observations	667,854	667,854	667,854	667,854

Notes:

1) Data: pooled 1990-1996 waves of the SIPP. Sample includes all individuals between the ages of 17 and 64 years of age regardless of employment status.
2) Dependent variables: column 1: indicator variable that equals one if individual covered by health insurance from any source and zero otherwise; column 2: indicator variable that equals one if individual is covered by employer health insurance in own name and zero otherwise; column 3: indicator variable for Medicaid coverage; column 4: indicator variable for any type of government provided health insurance. .
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, highest grade completed, marital status, presence of children in the family, and age.

Table 9B
NLSY Men
Whether Covered By Health Insurance
as a Function of Macroeconomic Conditions
and Employment Status
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Any Source	Own Current Employer	Spouse's Current Employer	Privately Purchased	Gov't Provided
Indicator:	.0025	-.0769	.0627	-.0067	.0462
National Recession	(0.04)	(-1.24)	(1.57)	(-0.20)	(1.84)
State Unemployment	-.0005	-.0038	-.0004	.0042	.0011
Rate	(-0.21)	(-1.55)	(-0.23)	(3.18)	(1.10)
Real Gross	.0005	.0006	.0004	-.0003	.0001
State Product	(0.61)	(0.68)	(0.77)	(-0.80)	(0.39)
Indicator:	.1703	.3433	-.0202	-.00004	-.0714
Employed	(24.40)	(45.68)	(-4.19)	(-0.01)	(-23.44)
Number of Observations	34,677	34,677	34,677	34,677	34,677

Notes:

1) Data: 8 pooled years of the NLSY. Sample includes the employed and those not employed.
2) Dependent variables: column 1: indicator variable that equals one if individual has health insurance coverage from any source and zero otherwise; column 2: indicator variable that equals one if individual has health insurance coverage through their current employer and zero otherwise; column 3: indicator variable that equals one if individual has health insurance coverage through spouse's current employer and zero otherwise; column 4: indicator variable that equals one if individual has privately-purchased health insurance coverage and zero otherwise; column 5: indicator variable that equals one if individual has government-provided health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Table 10A
SIPP Women
Whether Covered by Health Insurance
as a Function of Macroeconomic Conditions and Employment Status
Linear Probability Coefficients (and T Statistics)

Macroeconomic Variable	Any Source	Employer Coverage	Medicaid	Gov't Provided
Indicator: National Recession	.0027 (1.61)	.0003 (0.17)	-.0015 (-1.38)	-.0005 (-.36)
State Unemployment Rate	-.0032 (-6.54)	.0002 (.48)	.0024 (6.65)	0.0017 (4.35)
Real Gross State Product	.001 (4.55)	.00158 (6.67)	.0014 (10.30)	.0012 (7.02)
Indicator: Employed	.1700 (159.4)	.3034 (263.78)	-.1081 (-152.26)	-.1326 (-160.81)
Number of Observations	730,416	730,416	730,416	730,416

Notes:

1) Data: pooled 1990-1996 waves of the SIPP. Sample includes all individuals between the ages of 17 and 64 years of age regardless of employment status.
2) Dependent variables: column 1: indicator variable that equals one if individual covered by health insurance from any source and zero otherwise; column 2: indicator variable that equals one if individual is covered by employer health insurance in own name and zero otherwise; column 3: indicator variable for Medicaid coverage; column 4: indicator variable for any type of government provided health insurance.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, Medicaid generosity of state, highest grade completed, marital status, presence of children in the family, and age.

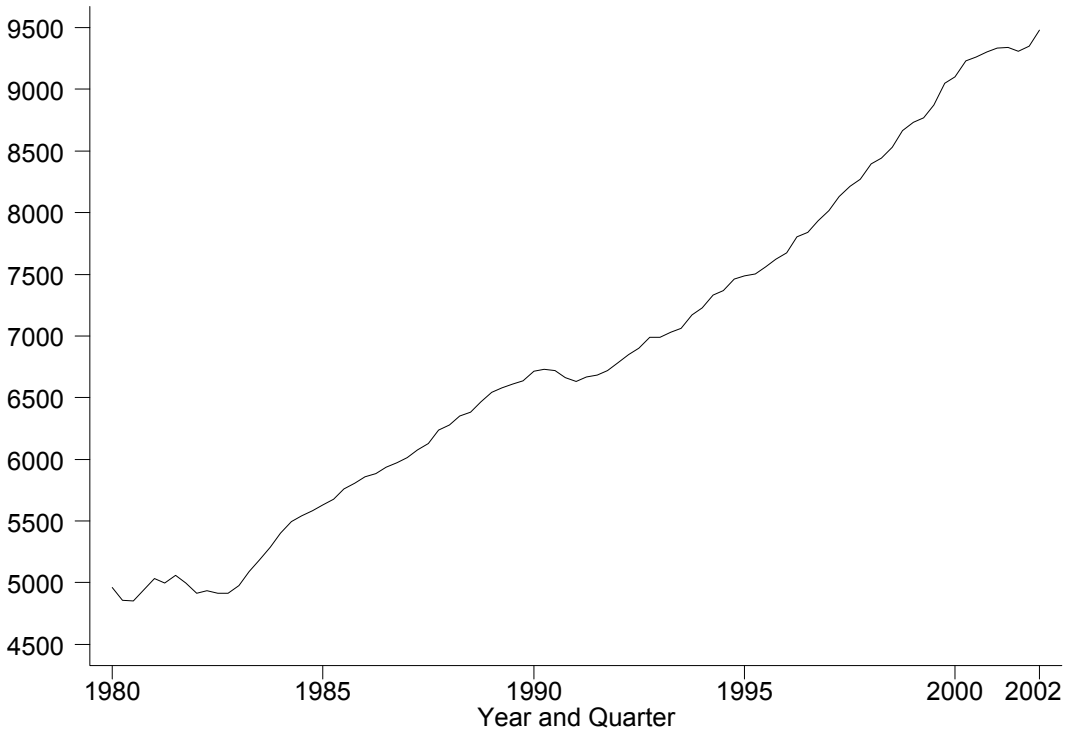
Table 10B
NLSY Women
Whether Covered By Health Insurance
as a Function of Macroeconomic Conditions
and Employment Status
Linear Probability Coefficients and (T Statistics)

Macroeconomic Variable	Any Source	Own Current Employer	Spouse's Current Employer	Privately Purchased	Gov't Provided
Indicator:	.0731	.0289	.1011	.0237	.0292
National Recession	(0.93)	(0.33)	(1.30)	(0.55)	(0.53)
State Unemployment	.0032	.0005	-.0048	.0017	.0058
Rate	(1.53)	(0.25)	(-2.33)	(1.50)	(3.94)
Real Gross	.0012	-.0002	.0006	-.0001	.0012
State Product	(1.57)	(-0.27)	(0.74)	(-0.29)	(2.15)
Indicator:	.0347	.2841	-.0661	-.0080	-.1210
Employed	(6.98)	(51.15)	(-13.53)	(-2.93)	(-34.65)
Number of Observations	36,465	36,465	36,465	36,465	36,465

Notes:

1) Data: 8 pooled years of the NLSY. Sample includes the employed and those not employed.
2) Dependent variables: column 1: indicator variable that equals one if individual has health insurance coverage from any source and zero otherwise; column 2: indicator variable that equals one if individual has health insurance coverage through their current employer and zero otherwise; column 3: indicator variable that equals one if individual has health insurance coverage through spouse's current employer and zero otherwise; column 4: indicator variable that equals one if individual has privately-purchased health insurance coverage and zero otherwise; column 5: indicator variable that equals one if individual has government-provided health insurance coverage and zero otherwise.
3) Other regressors: Individual fixed effects, year indicators, Medicare hospital wage index, highest grade completed, age, family size, and indicator variables for marital status.

Figure 1: Real Quarterly Gross Domestic Product, 1980-2002



Source: Bureau of Economic Analysis.

Figure 2: Mean Per Capita Gross State Product, 1980-1999

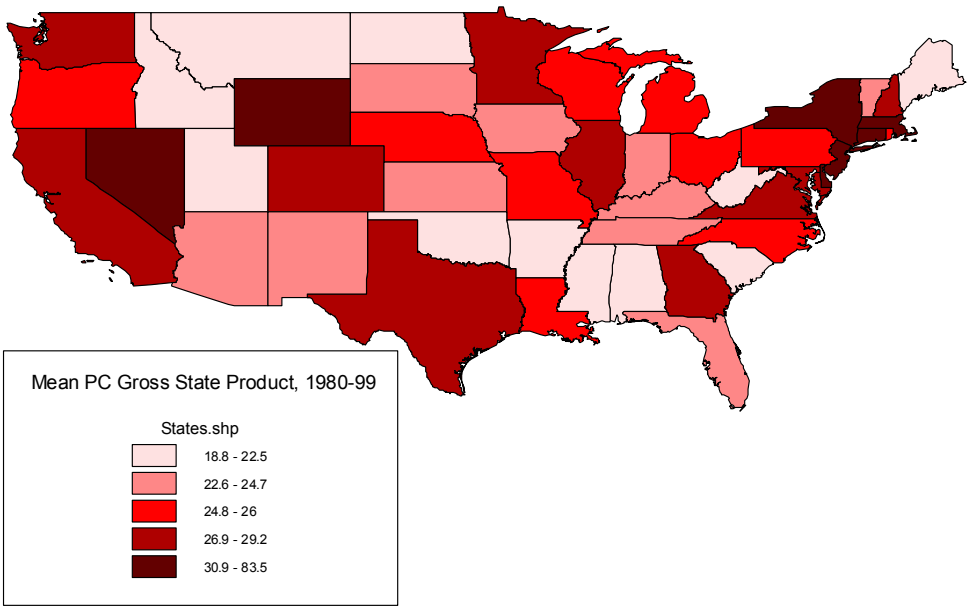


Figure 3: Variance Per Capita Gross State Product, 1980-1999

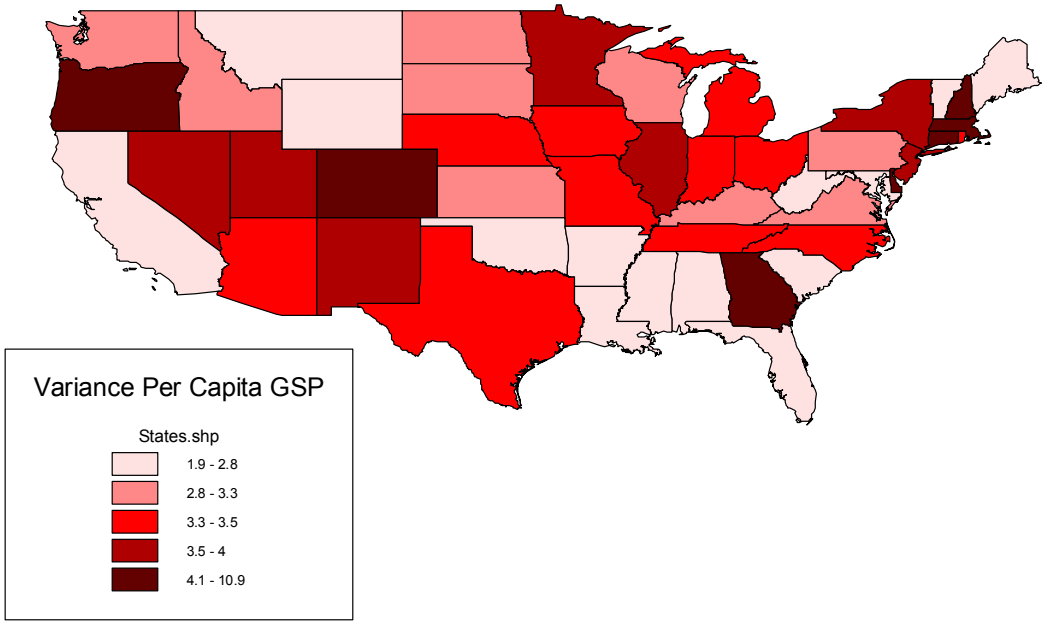
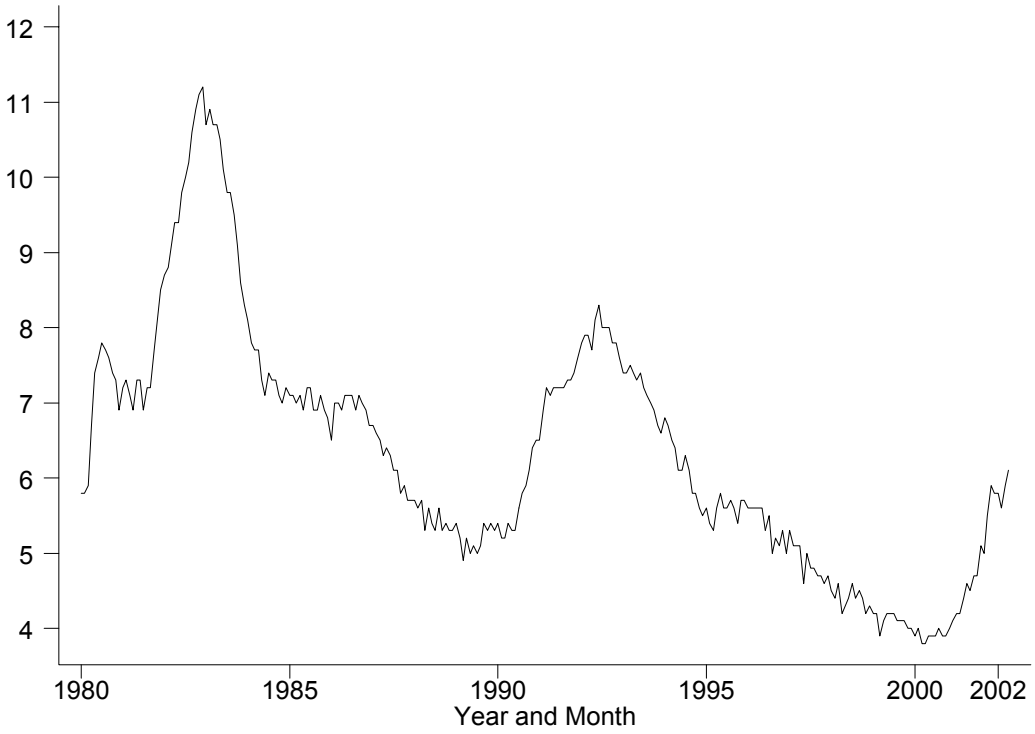


Figure 4: U. S. Monthly Unemployment Rate (Seasonally Adjusted), 1980-2002



Source: Bureau of Labor Statistics

Figure 5: Mean State Unemployment Rate, 1980-1999

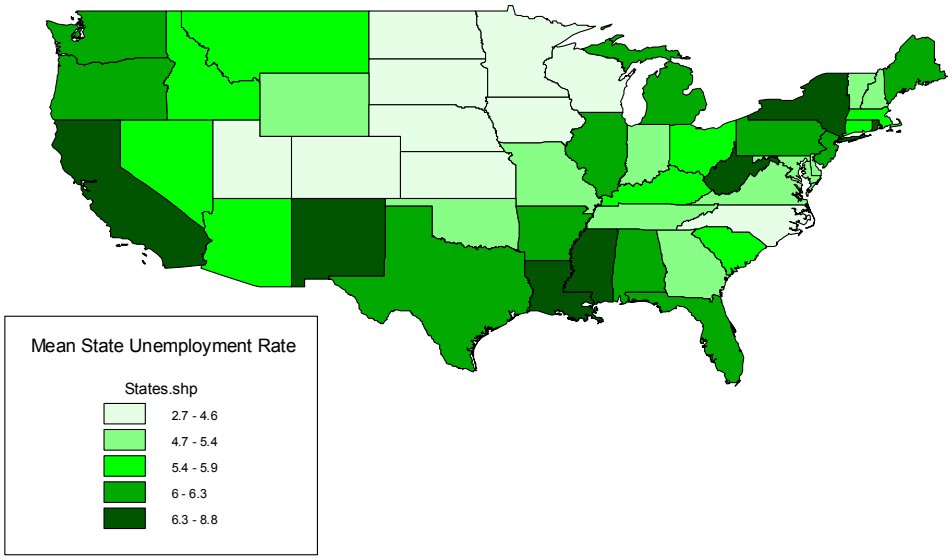


Figure 6: Variance State Unemployment Rate, 1980-1999